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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,874	06/27/2005	Hirokazu Nakayoshi	269074US6PCT	1732

22850 7590 11/30/2006

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EXAMINER

LOVELL, LEAH S

ART UNIT PAPER NUMBER

2875

DATE MAILED: 11/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/540,874

Applicant(s)

NAKAYOSHI ET AL.

Examiner

Leah S. Lovell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 27 June 2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 2, 11, and 14-24 are objected to because of the following informalities:
 - Regarding claims 2 and 14-24, these claims are objected to as being essentially the same as claims 1 and 3-13, respectively. Claims 1 and 2 are practically identical with only minor differences; however, these differences are purely grammatical and do not provide a difference in structure.
 - Regarding claims 11 and 22, on the final line of the claim, "forth" should be replaced with "fourth."
2. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-4, 12, 14, 15 and 23 are rejected under 35 U.S.C. 102(e) as being anticipate by Weindorf et al. (US 6,697,130).

Regarding claims 1 and 2, Weindorf discloses a back-light device for shedding light on the back of a liquid-crystal panel, the back-light device comprising:

a light-guiding plate [310] being in the shape of a rectangular plate [an inherent shape for a light-guiding plate], part of one of its side surfaces, each facing in a direction perpendicular to the directions of its thickness, being formed as an incident surface to allow light to enter [figure 3], and one of its top and bottom surfaces in the directions of its thickness being formed as a light-radiating surface [figure 3];

a flexible PCB (printed circuit board) [316] attached to part of the light-guiding plate in the vicinity of the incident surface [figure 3];

light sources [322. 324] being installed on the flexible PCB, each of them having a light-radiating surface, which is put in close contact with the incident surface of the light-guiding plate [figure 3]; and

a frame [302] housing and holding the light-guiding plate and the flexible PCB,

wherein the frame has a supporting wall on which the light-guiding plate is put, a window provided in the supporting wall and through which the light-radiating surface of the light-guiding plate is seen, and erected walls which are erected at the periphery of the supporting wall [figure 3];

wherein the flexible PCB has a PCB part on which the light sources are installed [part of 316 where the LEDs are attached, figure 3] and erected parts [part of 316 where the stiffeners 326 and LED control circuits 328 are placed; figure 3] which are erected on the far side of the PCB part away from the incident surface of the light-guiding plate [figure 3]; and

wherein the light-guiding plate is positioned with respect to the frame in the direction defined between the incident surface and the side surface facing in a direction perpendicular to the directions of the thickness of the light-guiding plate and being opposite to the incident surface by its side surface opposite to its incident surface being in contact with an erected wall of the frame and the erected parts of the flexible PCB being in contact with another erected wall of the frame [figure 3].

In regard to claims 3 and 14, Weindorf discloses the light-radiating surface of the light source is pressed to the incident surface of the light-guiding plate by the erected parts [figure 3].

Regarding claims 4 and 15, Weindorf discloses electronic parts [326, 328] whose terminals are exposed are installed on the PCB part in the vicinity of the erected part of the flexible PCB [figure 3].

In regard to claims 12 and 23, Weindorf discloses the frame comprising a front frame having the supporting wall, a window and erected walls and a rear frame covering the light—guiding plate and flexible PCB from the other surface of the light-guiding plate in the directions of its thickness and being joined to the front frame [figure 3].

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5, 7, 9, 10, 16, 18, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weindorf et al. (US 6,697,130).

In regard to claims 5 and 16, Weindorf discloses that the flexible PCB can be attached to the frame for heat sink purposes [column 6, lines 21-27]. It is disclosed that the central portion of the flexible PCB can be attached to the frame. It would have been obvious to one of ordinary skill in the art at the time of the invention to attach the erected portion of the PCB to an erected portion of the frame. One would be motivated to do so because eliminating the grounding wires from the rear of the frame and the connector to connect the PCB to the frame will allow the frame to be thinner.

Regarding claims 7 and 18, Weindorf discloses electrical components on a middle portion of the erected portion of the PCB; the erected portion of Weindorf, as shown in figure 3, shows that there is a bottom PCB portion and two erected PCB portions. The two erected portions consist of an end PCB portion [the erected portion furthest to the left] and a middle portion [the erected portion that connects the end portion to the bottom portion of the PCB]. Since the middle portion of Weindorf has electrical components, it would have been obvious to one having ordinary skill in the art at the time the invention was made that a copper-foil pattern is formed in the middle portion of the erected part of the flexible PCB in the directions of its thickness. It would have been obvious because it is well known in the art that the copper foil pattern is required to connect the electrical components to the rest of the circuit and the LEDs.

Regarding claims 9 and 20, Weindorf does not disclose that the flexible PCB is pasted onto one surface or the other surface of the light-guiding plate in the directions of

its thickness. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to paste the PCD to the light-guiding plate. One would be motivated to do so because the paste would ensure there would be no shifting in the PCB.

In regard to claims 10 and 21, Weindorf discloses the claimed invention except for the electronic parts being installed on a surface of the erected part opposite to its surface being in contact with the erected wall of the frame. It would have been obvious to one of ordinary skill in the art at the time of the invention to place the electrical parts on the erected portion of the PCB on a surface opposite to the surface being in contact with the erected wall of the frame because changing the location without changing the function does not provide unobvious results, and further it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

7. Claims 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weindorf et al. (US 6,697,130) as applied to claims 1 and 2 above, and further in view of Tsukamoto et al. (US 6,195,882).

Regarding claims 6 and 17, Weindorf discloses a flexible PCB. However, Weindorf does not disclose a copper-foil pattern is formed on a front surface or a back surface of the erected part of the flexible PCB. Tsukamoto discloses a copper foil pattern formed on the front surface or the back surface of a PCB [column 1, lines 15-16]. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a copper foil pattern formed on the front or the back of

the erected part of the PCB. One would be motivated to do so because it is well known in the art that copper-foil is a common material to electrically connect electrical components on a circuit board.

8. Claims 8, 11, 13, 19, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weindorf et al. (US 6,697,130) as applied to claims 1 and 2 above, and further in view of Lee et al. (US 6,862,053).

In regard to claims 8 and 19, Weindorf does not disclose a reflecting material reflecting light to the incident surface of the light-guiding plate is provided on the surface of the erected part of the flexible PCB facing the light source. Lee discloses a reflecting surface [figure 1; part of 722] to help guide light from the light source to the light-guiding plate. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide reflection means on the surface of the PCB of Weindorf. One would be motivated to do so because the reflective surface will help maximize the amount of light that enters the light-guiding plate.

Regarding claims 11 and 22, Weindorf discloses a light-guiding plate; however, while a rectangular light-guiding plate is inherent to the art, Weindorf does not disclose the specifics of the light-guiding plate. Lee discloses the light-guiding plate [724] is in the shape of a rectangular plate and has the incident surface [figure 1], a first side surface opposite to the incident surface, and second and third side surfaces opposite to each other between the incident surface and the first side surface,

wherein the frame has first to fourth erected walls which are
erected on the four sides of the supporting wall, the first and second

erected walls facing each other and the third and fourth erected walls facing each other;

wherein the light-guiding plate is positioned with respect to the frame in a direction perpendicular to the direction defined between the incident surface and the first side surface by the first side surface being in contact with the second erected wall, the second and third side surfaces being in contact with the third and fourth erected walls, and the second and third side surface being in contact with the third and fourth erected walls.

Both Weindorf and Lee disclose the supporting wall of the frame is rectangular as seen from above. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a rectangular light-guiding plate like that of Lee in the LCD display of Weindorf since it is well known that light-guiding plates are most commonly rectangular.

Regarding claims 13 and 24, Weindorf discloses a light-guiding plate having a flexible PCB around it having light sources on two sides of the light-guiding plate and the width of the erected parts of the flexible PCB is so determined that they are bent with respect the PCB part by the erected wall of the frame and press the light-radiating surface of the light source to the incident surface of the light-guiding plate [figure 3]. Weindorf does not disclose a side opposite to the light incident surface as being in contact with an erected wall of the frame. Lee discloses the side surface of the light-guiding plate being opposite to the incident surface is in contact with the erected wall of

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the frame and the flat flexible PCB and the light-guiding plate are fitted into the frame [figure 1]. It would have been obvious to one of ordinary skill in the art at the time of the invention to omit one side of the flexible PCB/light source combination of Weindorf to mimic the light-guiding plate/light source combination of Lee because omitting a portion of the PCB does not provide an unobvious result, and further it has been held that omission of an element and its function in a combination where the remaining elements perform the same function as before involves only routine skill in the art. In re Karlson, 136 USPQ 184.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Takahashi et al. (US 5,400,160)
- Hashimoto (US 6,417,897)

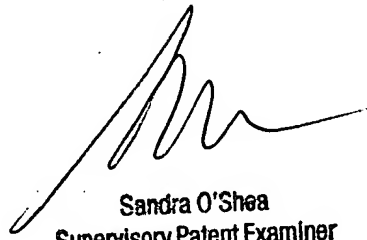
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leah S. Lovell whose telephone number is (571) 272-2719. The examiner can normally be reached on Monday through Friday 7:45 a.m. until 4:15 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Renee Luebke can be reached on (571) 272-2009. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Leah Lovell
Examiner
20 November 2006



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